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U.S. Environmental Protection Agency
Science Advisory Board
Committee: Advisory Council on Clean Air Act Compliance Analysis (Council) Health and Ecological Effects Subcommittee (HEES)

Summary Minutes of Public Meeting
Date: June 28-29, 1999

Committee Members: (See Roster - Attachment A.)
Date and Time: Monday, June 28, 1999 from 9:30 am to 5:30 pm and Tuesday, June 29, 1999 from 9:00 am to 1:00 pm. (See Federal Register Notice - Attachment B).
Location: SAB Conference Room M3709, 401 M Street, S.W., Washington, DC Washington, DC
Purpose: To review the draft Prospective Study: Report to Congress, with a focus on the health and ecological aspects of the Clean Air Act Amendments (CAAA) Section 812 Prospective Study data
Attendees: Committee Members: Dr. Paul Lioy, Chair, Dr. Rick Freeman, Dr. Jane V. Hall (by phone), Dr. Michael Kleinman, Dr. Timothy Larson, Dr. Morton Lippmann, Dr. Joseph Meyer, Dr. Carl Shy, Dr. George Taylor, Dr. George Wolff (by phone) ; Dr. Angela Nugent , Designated Federal Official - SAB Staff); Speakers: Mr. James DeMocker (EPA, Office of Air and Radiation), Dr. Brian Heninger (EPA, office of Policy), Mr. Bryan Hubbell (EPA, Office of Air and Radiation), Art Fraas (Office of Management and Budget, Office of Information and Regulatory Affairs), Mr. Jared Hardner (of Industrial Economics, Incorporated). (See Meeting Sign-In Sheets for other Attendees - Attachment D.)

Meeting Summary:

The meeting followed the issues and general timing as presented in the meeting Agenda, except where otherwise noted (see Meeting Agenda - Attachment C). There were written comments submitted to the Committee, and there were written requests to present public comments during the discussion.

Welcome and Introductions - Dr. Lioy, the Chair, opened the session at (9:30 a.m..) welcoming members and consultants (Roster, Attachment A), and reviewed the agenda (Attachment C). Dr. Angela Nugent, Designated Federal Official for the HEES reviewed the materials which had been provided to Committee and noted that a complete set of materials was available at the meeting for reference purposes. She reminded panelists that contacts with the Agency or public during the Committee deliberative phase (i.e., prior to production of a consensus draft report) should involve the DFO to avoid the perception of undue influence. She described the process for completing a final report to be sent to the Administrator, including the production of a

public draft, and review and approval by the Council. Then she requested that panel members introduce themselves and make a voluntary statement for the record regarding their research interests and experiences related to the review topic. No "particular matter" conflicts of interest were identified.

Discussion of Committee's Advisory (Review) of: the draft Prospective Study: Report to Congress, with a focus on the health and ecological aspects of the Clean Air Act Amendments (CAAA) Section 812 Prospective Study data.

Introductions

Chairman Lioy opened the meeting by reviewing the agenda and providing an update on the discussion of the draft HEES Part 1 Letter Advisory that had been discussed by the Council at its Teleconference on July 22, 1999. He reported that the Council had approved the draft report subject to minor revisions and asked the Designated Federal Official, Angela Nugent, to complete the revisions as soon as possible.

Overview of Review Issues and Status of the First Prospective Study

Mr. James DeMocker (EPA,Office of Air and Radiation) gave an overview of issues to be discussed by the HEES and an update on EPA activities since the April 20-21, 1999 meeting. The special focus of the current meeting was to ask the HEES its views, within the context of the first Prospective Study, regarding the validity and reliability of data selected, methodologies and models employed, and results obtained. The topic areas to be covered were health effects, criteria pollutants, hazardous air pollutants, and ecological assessment. Mr. DeMocker noted that the Agency did not have results in hand concerning agricultural yield changes and that it intended to include these results in a chapter devoted to welfare effects. Mr. DeMocker also discussed the timetable for completing the study. The Agency intends to meet the August 30th deadline to submit a report to Congress, unless EPA receives an extension that would allow it to submit the report in the fall. To meet the August deadline, EPA plans to drop the configuration of supplemental reduction scenarios with associated air quality and benefit model runs.

Several members of the Subcommittee discussed how the Agency will address the National Ambient Air Quality Standards (NAAQS) State Implementation Plan call and associated uncertainties resulting from a recent court ruling concerning that call. Mr. DeMocker and the Subcommittee members agreed that the First Prospective Study would not address the NAAQS SIP call issue, because it did not specifically concern implementation of the Clean Air Act Amendments of 1990. Instead, it related to exercise of authority already present in the Clean Air Act prior to 1990.

Ecological Benefits Assessment

Brian Heninger (EPA, Office of Policy) and Jared Hardner (Industrial Economics) provided an overview of new issues and findings since the April HEES meeting. They began by discussing the results from analysis of tropospheric ozone impacts on commercial timber, using model simulations extrapolated to forest areas using Voronoi-neighbor averaging. Using the P-NET II model with ozone and meteorological and

forest data from across the United States, the Agency found a fairly clear correlation between predicted reduction in forest production and ozone levels across all regions and ozone scenarios.

They also discussed how they related estimates of primary productivity to forest growth rates and then developed an economic analysis from that information. The resulting data showed an unusual spike in timber growths estimated for 2008 as a result of the US Forest Service estimates that timber growth in the South East will climb as a result of reduced ozone. The Agency also reported that it revised its estimates of benefits associated with acidification to include a set of lakes in New York that were not considered in the first analysis.

The Agency then turned to a discussion of choosing a case study for assessing ecological benefits associated with CAAA controls for hazardous air pollutants (HAPs). They discussed a selection based on evidence of ecological harm, data, and models. The Agency is planning a case study of mercury emissions, and sought HEES advice on how to quantify the CAAA impact on mercury emissions.

The Agency closed its presentation by outlining proposed research needs to strengthen benefits assessments in the future.

The Subcommittee commended the Agency for the list of proposed research needs identified in the presentation. Members noted, however, that the discussion of those needs in the draft report did not include such specific information. They asked the Agency to include more detailed discussion in the draft report. In the Subcommittee's view, valuation techniques needed to be prominent as research needs, and that the Agency had not made much progress over ten years since the Clean Air Scientific Advisory Committee (CASAC) called for improved assessment of ozone ecological effects. One member observed that there was no mention of research needs related to wildlife effects either in the findings of the Prospective Study or the list of research needs. In his view, the Agency was again being "opportunistic," mainly taking advantage of data easily available and ignoring issues where there were no data. The Chair agreed and characterized the situation as a "light under the lamppost problem." He closed the discussion of research needs by emphasizing that the Agency needs to promote the idea that ecological systems need to be focus of attention, not individual service flows or individual effects, despite the constraints of what the Agency is able to quantify/identify now. For the discussion of research needs in the current Prospective Study, the Agency must identify the research that can provide the links among service flows and currently identified isolated effects that can make possible a more comprehensive system valuation for future Prospective Studies.

In terms of ecological assessment of air toxics, the Subcommittee urged the Agency to consider global impacts of air toxics and the data available on that. For mercury, a member suggested that the Agency take advantage of the assessment of border states by the International Joint Commission. He suggested that Dr.Gary Foley at NERL would have information useful for such an analysis. The Agency then raised the issue of how to identify and partition the component of global loadings that represent the US contribution to mercury world-wide. Several members responded to this question. They suggested: (1) use of mass balance, available models and considerable knowledge about bioaccumulation; (2) checking guidelines for Regulatory Impact Analyses, which addresses the issue of extra-territorial benefits; and (3)

following the template developed for the Prospective Study in Appendix G for stratospheric ozone, which raises many of same issues (e.g., chemicals with very long lifetimes, that are highly nonreactive, disperse widely, and have cumulative, pervasive impacts). Members also suggested that the table developed for evaluating candidates for the case study be changed to include a row headed "ability to partition to EPA emissions," and also to provide an explanation for the use of the term "exposure" in the table.

The Subcommittee then turned to the general charge questions concerning the data, methods and results associated with discussion of ecological benefits in the draft text. A lead discussant urged the Agency to include a paragraph on ecological issues in the Executive Summary, that would link those issues to sustainability and human welfare. He also noted the anomaly of separating agricultural effects from the discussion of ecological effects, and asked the Agency to integrate the two or make the linkage clearer by reference in the text. He urged Agency to use care when they employ the term "ecosystem effects." He also emphasized the importance of discussing the limitations and advantages of using the models and methods chosen, especially in the case of the PNET-II model .

Both lead discussants raised questions about the Agency's estimate of changes in primary productivity; they believed the range estimated (4-20%) was very large, probably an artifact of the model used to estimate timber effects, and could potentially misrepresent major ecosystem effects. Mr. DeMocker responded that the Agency would expand the uncertainty tables in the chapter on ecological effects to acknowledge this uncertainty. The Chair asked Mr. DeMocker to provide revised language on this point to the two lead discussants through the Designated Federal Official within the next two weeks.

Hazardous Air Pollutants (HAPs)

Mr. DeMocker began the discussion of HAPs by introducing Dr. James Cogliano (EPA, Office of Research and Development) and Dr. Carl Mazza (EPA, Office of Air and Radiation) to discuss progress on planning an SAB workshop on HAP research needs. Mr. Cogliano described efforts to date to scope out knowledge gaps related to data and modeling these chemicals. His discussion focussed on the hazard component of the risk assessment and Subcommittee members responded by indicating an interest in the exposure component as well. One member reported that states are beginning to measure air toxics. Dr. Mazza reported that EPA's Office of Air Quality Planning and Standards (OAQPS) was developing a white paper on air toxics monitoring, with the goal of giving guidance to states on monitoring. It is likely to include a scheme for prioritization linked to priorities under urban air toxics strategy.

The Chair described the goal of the workshop as something quite concrete: to provide a way to improve HAPs benefits assessment for the next Prospective Study. The goal would not be a "be all and end all analysis," instead data quality and a framework that could be used to dramatically improve the approach to HAPs in the next Study. Mr. DeMocker responded that such a goal would also be useful to the Agency's work on residual risk. The Subcommittee and members then discussed possible approaches to the workshop: (1) Subcommittee members viewed the workshop as including members from various SAB committees including the Integrated

Environmental Exposure Committee, CASAC, Environmental Health Committee, and the HEES; (2) case studies showing a proposed approach; (3) provocative opening session with experts such as Dennis Paustenbach (4) involvement of decision theorists (e.g., Granger Morgan, John Graham); (5) strategies for improving monitoring, including discussion of the OAQPS white paper and possibly other schemes for prioritization; and (6) establishment of a planning group with representation from EPA and the SAB.

The Subcommittee then discussed whether the workshop should also include ecological as well as health assessment for HAPs. The Agency noted that addressing ecological concerns would expand the focus of the workshop and perhaps make it unmanageable. Several subcommittee members noted similarities between the current lack of data and methods for both health and ecological assessments. The suggested that the workshop could advance the state of thinking for both kinds of effects.

Health Effects of Criteria Pollutants

Dr. Don McCubbin (Abt Associates, Inc.) gave an overview of preliminary results for mortality and morbidity associated with criteria pollutants. He discussed: (1) methods for estimating effects that were based on the advice received from the Air Quality Modeling Subcommittee for interpolating emissions near non-monitored sites; (2) morbidity effects for particulate matter and ozone; (3) illustrative calculations for mortality; and (4) methodology for pooling information from studies on hospital admissions.

The lead discussants presented some detailed editorial comments to improve the text of the draft chapter. They agreed that the data, methods and results obtained were sufficiently valid and reliable for the purposes of the current Prospective Study. They agreed that the models and methodologies used were adequate for the purposes of the current Prospective Study. There was no consensus on an issue raised by one discussant for the Agency to discuss potential risk-risk trade-offs associated with increased UV-b radiation due to lower tropospheric ozone, but it was stated that the information was very weak and more information is required. Further, there was no consensus on identifying one end of the PM threshold range as zero. The latter will be the subject of much research in future years.

15-Year Lag and Particulate Matter (PM)Exposure

Mr. James DeMocker opened the discussion by outlining the background for the Agency's approach to estimating PM exposure. He referenced the 1999 HEES Advisory, which indicated no scientific basis for a lag, but called for a consideration of a range. He indicated that it would be inconsistent to introduce a lag structure for PM effects, while the Agency did not factor a lag into its analysis for other health effects. He also demonstrated a wide range between the Agency's current approach to benefits assessment, the OMB proposed approach, where PM effects would only be counted after 15 years, and a phased-in approach used in the Tier-2 rulemaking that would distribute some effects over the first few years after exposure and distribute other effects over a 15-year period . Dr. Bryan Hubbell then presented an analysis of the World Health Organization Study (WHO, 1996) study referenced by the letter from the Office of Management and Budget (OMB) and the Council of Economic Advisors to Dr.

Donald Barnes. He argued that the 15-year lag assumption in the WHO study derived from the limited data for that study. The study did not include information about timing of exposure or onset of effects. He showed that the study explicitly identified the assumption as for purposes of analysis in that particular study only.

Mr. Art Fraas from the OMB, Office of Information and Regulatory Affairs, spoke briefly to introduce his organization's interest in the assumptions underlying benefits associated with controlling for PM exposure. He stated that because of the substantial uncertainties associated with the relationship between Nitrogen Oxide reductions and premature mortality, OMB believes that it is not possible to develop a scientifically defensible distribution that reflects that uncertainty. He therefore proposed that the best way to represent that uncertainty is to develop higher and lower end estimate. He asked the HEES advice as to whether the World Health Organization Study (WHO, 1996) that utilized a 15-year lag for PM exposure provided a scientific basis for estimating lag effects within the Prospective Study.

Dr. Mort Lippmann identified himself as a panelist for the WHO study and described that effort as an exercise to use available data to approximate impact on annual mortality. He stated that the 15-year lag might be reasonable to assume for a fairly young group. He suggested that with an older group, or a group with impairments, effects would show up in much less than 15 years.

The lead discussant agreed and noted that there is no scientific evidence for 15 year lags cited in WHO report which explicitly states that the 15-year lag was adopted for simplification, not because there was a scientific rationale. A 15-year lag would not be appropriate for air pollution effects on already impaired people (the elderly, those with chronic bronchitis, other impairments) where additional air pollution will stress them, and potentially cause critical effects. Both Subcommittee members agreed it may be reasonable to plug in some lag, but 15 years is arbitrary and not consistent with epidemiological observations.

Subcommittee members then considered options for developing a reasonable approach to a lag. Members noted that the Tier 2 rulemaking scenario would make better sense than OMB 15-year scenario, because it indicates an immediate reaction to PM. They considered it a best estimate and recommended that the Agency conduct a sensitivity analysis for other estimates (e.g., 0, 8, 15-year lags). They also noted that the lag was appropriate to introduce only for mortality effects, not for morbidity effects because it would become too complex.

Concluding Discussion

The Subcommittee concluded its deliberations with a discussion of plans to develop a draft report before the Council meeting on July 13-14, 1999. Members ended the session by complimenting the Agency on improvements noted in the draft report, and specifically in the characterization of systems effects. The Agency responded with appreciation for the Subcommittee's advice and a commitment to include the advice in the revised Prospective Study.

Action item(s):

1. The Subcommittee members agreed to provide initial responses to the Agency's Charge Questions to the DFO by Wednesday, July 7, 1999.

The Committee scheduled its next meeting for: No meeting scheduled

At 12:30 p.m., Dr. Lioy adjourned the meeting.

Respectfully Submitted:

Designated Federal Official

Certified as True:

Chair

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by the SAB members and consultants (M/C) to the Agency during the course of deliberations within the meeting. Such ideas, suggestions and deliberations do not necessarily reflect definitive consensus advice from the M/C. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters, or reports prepared and transmitted to the EPA Administrator following the public meetings.